

Production, Economics, Employment Generation and Marketing Pattern of Rattan-Based Cottage Enterprises: A Case Study from an Urban Area of North-Eastern Bangladesh

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Abstract Rattan, an important non-timber forest product, is a flexible palm used in weaving baskets or furniture. Rattan is light yet sturdy, making it suitable for furniture that can be moved often. Bangladesh has a large number of rattan-based enterprises. This paper reports a case study carried out in Sylhet City Corporation of north-eastern Bangladesh, exploring the production, financial profitability and marketing of rattan-based products, and the problems and priorities of rattan-based enterprises as well as their potential contribution to employment opportunity. A sample survey was conducted of 58 randomly selected rattan-based enterprises with entrepreneurs personally interviewed using a semi-structured questionnaire. Based on the total investment, the enterprises were divided into large, medium and small categories. Three origins of rattan (Local, Myanmar and Indonesia) and five species were used by the enterprises to produce 29 rattan-based product types. Rattan products were divided into three basic categories, viz. domestic utensils, domestic decorative articles and others for which uses are not specific. Among the three rattan origins, processing cost of local and Myanmar rattan species products was less and more articles were sold than for Indonesia rattan species. Financial analysis indicated that rattan-based enterprises are a profitable and attractive option for local socio-economic development. Entrepreneurs' views on major problems and issues in rattan-based product trading and suggested measures to improve the condition of rattan-based enterprises also collected. Rattan-based enterprises will generate more domestic revenue, foreign exchange and employment if policies are adopted to

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provide the enterprises with a reliable source of raw materials and technical and financial assistance from Government to NGOs to sell the products, and expand market facilities in both local and international markets.

Keywords Entrepreneurs · Financial profitability · Marketing channel · Non-timber forest products · Sylhet City Corporation

Introduction

Non-timber forest products (NTFPs) can play critical role in providing food, medicine and substantial income through their collection, processing, selling and consumption, thereby reducing poverty and creating incentives for forest conservation (Hegde et al. 1996; Uma Shankar et al. 1996, 2001; Bawa and Gadgil 1997; Zasiuddin 2004). In 2001, The United Nations Conference on Trade and Development (UNCTAD) estimated the total value of world trade in NTFPs to be on the order of US \$11 billion. About 1.5 billion people worldwide—especially in Asia and Europe—depend on bamboo and rattan and their associated products to improve their livelihoods (INBAR 2011). Employment and income from small-scale NTFP enterprise, particularly for poor people, are of growing importance in the economy of developing countries (Gunatilake et al. 1993; Arnold 1995).

NTFPs are important raw materials for forest-based cottage industry in Bangladesh (Nath et al. 2000), providing major employment opportunities for the poorest rural population of nearly about 300,000 persons (Basit 1995), and contributing about Tk. 1.3 billion¹ annually to the national economy (GOB 1993 cited by Uddin and Mukul 2007). According to Bangladesh Small and Cottage Industries Corporation (BSCIC), there are more than 3,240 small-scale cottage enterprises distributed throughout the country, providing employment for 42,005 persons and contributing 5.8% to GDP in 2000 (Rahman 2006).

The total sales value of rattan products in Europe and USA is \$3 billion a year and Myanmar now has the greatest value of rattan exports globally (Rahman 2006; Alam and Khan 2006; Farhana 2009). The trade of rattan products is governed by international agreements such as the Convention on International Trade in Endangered Species (CITES) and the Convention on Biological Diversity (CBD) (TSPN 2011). The research findings of (Corner 1966; Mohiuddin et al. 1986; Dransfield 1992; Sunderland 1998) that rattans are used extensively throughout the world and add substantial income to the people.

About 600 species of 13 genera of rattan are found in the tropics among which 297 species of nine genera exist in Indonesia (KPSHK 2010; Wikipedia 2001), the rest being found in the Philippines, Myanmar, India, Vietnam, Sri Lanka, Malaysia and Bangladesh (Alam and Khan 2006; Wikipedia 2001). In Bangladesh, rattan or cane (also called *Bet*) is grown mostly in homesteads, swamps and low-lying areas, and natural forests. Only 11 species of two genera—namely *Calamus* and *Daemonorops*—are naturally grown in Bangladesh (Alam 1990; FAO 1993; Alam

¹ 72 Taka (Tk.) is equivalent to US \$1 as of March 2011.

and Khan 2006). The climate of Bangladesh is well suited for growing rattan (BBS 2002). Out of the recorded species in Bangladesh, *Calamus flagellum*, *C. floribundus*, *C. gracilis* and *C. quinquenervius* are now not readily available (Alam and Khan 2006).

Rattan is used extensively throughout Bangladesh as a raw material in cottage enterprises for making furniture, handicrafts and other household articles, because of its low cost and natural appearance (Nuruzzaman 2001). In Bangladesh, Forest dwellers and local people collect rattan from the forest on payment of royalties to the Forest Department (Durst et al. 1994).

Rattan is used for domestic purposes by the rural population, and for sophisticated furniture and luxury souvenirs suitable for export. Rattan-based furniture enterprises are the most important activities in Chittagong, Chittagong Hill Tracts and Sylhet division of Bangladesh (Ara 1997a, b). A number of rattan-based enterprises are also established in Comilla, Bogra, Jessore and Rajshahi districts. Only *C. viminalis* var. *fasciculatus* species sometimes found near forest border areas of Bangladesh. *C. tenuis* occurs along the edge of mangrove forests towards the land side (Alam and Khan 2006). In furniture making *C. guruba* and *C. tenuis* are commonly used in Bangladesh (Banik 1998). Bangladesh exports rattan-based products to Russia, Germany, Canada, Singapore, Japan, Middle East and some other countries (Alam and Khan 2006; Farhana 2009).

Despite the high value and widespread use of rattan, most of the studies in Bangladesh are concentrated mainly on management, employment generation or silviculture of rattan (e.g. Mohiuddin and Ara 1995; Azad 2002; Alamgir et al. 2005, 2006; Alam and Furukawa 2009). The study reported here examines the rattan-based products and evaluating the demand of products, employment generation, financial profitability of the enterprises, problems and priorities of rattan-based enterprises, regional and international marketing pattern of rattan-based products, and the contribution of rattan enterprises to socio-economic development of Bangladesh in general and of Sylhet City in Sylhet district in particular. The study is designed to generate policy implications and develop new strategies for increased investment in and profitability of rattan-based enterprises, and increased support from Government to NGOs.

The Study Site

The study was conducted in the Sylhet City Corporation (SCC) area of Sylhet district, in far north-east of Bangladesh on the northern bank of the Surma River (Fig. 1) and surrounded by the Tripura, Jaintia and Khasia hills of India. The SCC belongs to a group of medium-sized urban centres that have grown rapidly in recent years and have steadily improved their livelihood standard ranks in the urban hierarchy. SCC consists of 27 wards and was established in 2002; it has an area of about 26.5 km². The area has experienced rapid development in the last few years and thousands of people from the countryside have migrated there for better livelihood opportunities. The total number of households in the SCC was 55,514 and the estimated population 427,265 as of 2007, increasing to 463,198 in 2008

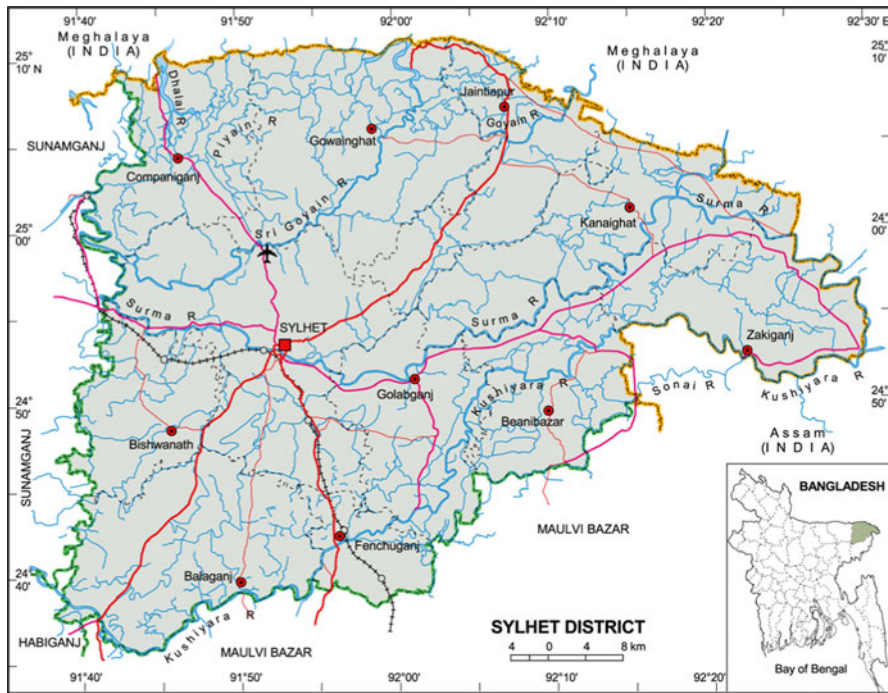


Fig. 1 Location of the study area (from Banglapedia 2011)

(BBS 2009). Sylhet city lies in the monsoonal zone and experiences a hot, wet and humid tropical climate. The summer season (March–May) is relatively hot (average daily maximum temperature 31.8°C), June to October is the rainy season, and November to February are the winter (average temperature 12.9°C). Nearly 80% of the annual average rainfall of 3,334 mm occurs between May and September (BBS 2006). The SCC was selected purposively because this area is famous for some specific NTFPs including rattan, bamboo and murta (*Schumannianthus dichotoma*) and has been the major supply source of these NTFPs nationally and NTFPs-based products internationally for decades because of the relatively low prices due to year-round supply from nearby forests, swamp areas and private homesteads. The main products include rattan and bamboo-based products and murta-based products *Sitalpati* or *Sylhete Sitalpati* (a traditional bed mat of Bangladesh).

Research Method

Multistage random sampling was applied to locate the survey area and then enterprises for the study within the Sylhet City Corporation as the primary sampling unit and ultimate sampling unit, respectively. A total of 58 rattan enterprises were selected randomly following a sampling intensity of 32%. A semi-structured questionnaire was developed for personal interviews of entrepreneurs of enterprises.

An entrepreneur was defined as a person who owns a temporary or permanent rattan-based cottage enterprise, purchases rattan and sells manufactured products. The questionnaire was designed to collect demographic and socio-economic background data on the entrepreneurs, and on the supply, sources and cost of raw materials, status of labourers (artisans, locally termed as *karigar*) in rattan shops and factories, manufacturing process, products and products selling prices, financial performance and marketing channels and problems and issues in rattan-based products trading.

Personal interviews were conducted during October 2010 to February 2011. Only male entrepreneurs were interviewed.² Interviews were performed during daytime, and took about 50 min on average. On each survey topic, entrepreneurs were encouraged to express their views and provide additional information regarding rattan-based cottage enterprises in the area. Data were also collected from secondary sources, including books and conference papers, journal articles, brochures, students' theses and websites.

The annual revenue obtained from each type of rattan product were estimated from the survey data where the values of total inputs (e.g. raw materials, transportation, wages of the labourers, allowance for self-labour, fixed costs of permanent structures, depreciation, rent and electricity payments, taxes on income and where applicable interest of loans) and outputs (from sale of primary and secondary products) were estimated at current prices. Production costs of the rattan-based products were determined from the reported expenditure on inputs (including wages of labourers and enterprise operating costs). The formulae used here is adapted from Alamgir et al. (2006), Uddin et al. (2008) and Rana et al. (2010).

Study Findings

The average age of respondents was 41 years, and the literacy rate was 63%. About 74% of entrepreneurs had been involved in rattan-based enterprises for at least 10 years, and 13% for 5–10 years. Rattan-based cottage enterprise was the main occupation for 93% of entrepreneurs. Other major income generating occupations included service, family member working abroad (historically, SCC has considerably higher per capita income than other parts of Bangladesh, mainly living in the United Kingdom) and other business. Because production of rattan furniture is profitable people of all occupations want to invest in rattan enterprises as primary or secondary occupations. About 60% of enterprises were found to collect raw materials (unprocessed rattan) only from local planted sources, mainly from Sunamganj and Moulvibazar districts, from Chhatak, Hobiganj, Jafflong and Jaintiapur *upazillas* (sub-district or administrative entity), and from natural forests of Sylhet division. The remainders depend both on the entire country (forests of

² Sylhet City is described as a 'City of Saints', with the mausoleum of the great saints Hazrat Shahjalal and Hazrat Shahparan, who brought Islam to Bengal during the fourteenth century being located here (Rahman 2010). Thus as a religious norm the women have to maintain *pardah*, or remaining unseen from the unknown male visitors, so the women do not engage in any rattan marketing activities but they work in enterprises as family members or labourers in the study area.



Fig. 2 (Clockwise) **a** unprocessed rattans dried on house roof, **b** artisan works with rattan, **c** male-women worked together with rattan, **d, e** diversity of rattan products in shops, **f** rattan products—dining table with chairs

Chittagong and Chittagong Hill Tracts and Comilla, Bhoirav and Rajshahi districts) and imports from Indonesia and Myanmar.

A total of 382 labourers (who manufacture the rattan-based products) were engaged in the 58 enterprises surveyed, among which 64% were male, 34% women and 2% children (of age 15 or less). Though men carry out much of the raw material collection, manufacturing and marketing of the products, women were also active in making rattan products in enterprises and sometimes selling products to neighbours. The number of labourers varies from rattan enterprise to enterprise depending on the size and scale of production capacity and varying within years. About 73% of entrepreneurs had inherited the rattan business.

The numbers of labourers employed varied between 7 and 15 per enterprise. Among the labourers about 63% were skilled and 25% semi-skilled and 75% were permanent laborers, the others being employed as temporary workers when needed. In some enterprises all family members were engaged as employees. The daily average wage rate of temporary adult males and women and of children during the period were Tk. 180, 130 and 90, respectively. The wage rate for full-time labourers varied from Tk. 5,500 to Tk. 10,000 per month, skilled laborers received highest salary. Generally, men were more highly paid than women, in part because they were full time labourers. The greatest employment level was found to be during October–February, because raw materials are most readily available, and drying, processing and marketing of rattan products take place in this season. Figure 2

Table 1 Species commonly used at local rattan enterprises of the study area

Species	Local name	Use frequency	Performance ^a	Price range Tk./piece	Uses
<i>Daemonorops jenkinsianus</i> Mart.	Golla bet	+++	Satisfactory	80–90	Structuring mainframe and products
<i>Calamus tenuis</i> Roxb.	Jali bet	+++	Good	40–50	Binding and designing of products
<i>Calamus guruba</i> Ham.	Sundi bet	+	Poor	50–60	Binding and designing of products
<i>Calamus latifolius</i> Roxb.	Karak bet	+	Very good	900–1,000	Structuring mainframe and products
<i>Calamus longisetus</i>	Bodom bet	++	Satisfactory	150–200	Structuring mainframe and products

^a Rattan performance was ranked by the entrepreneurs based on working and product quality

illustrates the processing of raw material (rattan) to produce products and diversity of rattan-based products in the shops.

Utilization of Rattan and Rattan-based Products in the Study Area

Five species of rattan—viz. Golla bet (*Daemonorops jenkinsianus* Mart.), Jali bet (*Calamus tenuis* Roxb.), Sundi bet (*Calamus guruba* Ham.), Karak bet (*Calamus latifolius* Roxb.) and Bodom bet (*Calamus longisetus*)—were found to be frequently traded locally and used for manufacturing products (Table 1). *C. latifolius* and *C. longisetus* were imported from Indonesia to Myanmar, respectively. *D. jenkinsianus* was the most utilized species followed by *C. guruba*, *C. longisetus* and *C. latifolius*. *D. jenkinsianus* is locally available and inexpensive and thus favoured by the entrepreneurs. Another reason for using this species is suitability for making any products by the artisans because it is easy to structure mainframes and products with this species. *C. tenuis* is used in every article as binding material. The purchase price per piece *C. tenuis* is Tk. 40–50. Nowadays, synthetic binding material is also used in the rattan enterprises because this is less expensive and has a longer life. The price of *C. latifolius* and *C. longisetus* was found to depend on their maturity, quality (usable length, thickness, colour) and demand for products in international market. Generally, the price per piece of *C. latifolius* and *C. longisetus* varies from Tk. 900–1,000 and Tk. 150–200, respectively. Overall prices of all species are highest in the peak rattan supply season (October–February), and also varies with product demand and the influence of middlemen who buy strategically. Local demand is greatest in winter.

A total of 29 rattan-based product types were recorded from the surveyed rattan enterprises. A brief summary of the articles produced from various rattan species with their trade and common name, common uses, availability and trend of demand in the local market is presented in Table 2. For better understanding and convenience the rattan products were divided into three basic categories, viz. products necessary for daily life (domestic utensils) (DU), domestic decorative luxury articles (DDA) and others (O) which are used infrequently. According to this classification eight articles

Table 2 Rattan product types, labour requirement per article, major use, availability and trend of utilization in the study area

Article		Man days required to produce	Major use ^a	Availability ^b	Trend of utilization ^c
Local/trade name	Common name				
Khat (large)	Bed	0.86	DU	17 (29)	↓
Khat (medium)	Bed	0.67	DU	36 (62)	↑
Sofa set (1 set)	Sofa set	0.6	DU, DDA, O	34 (59)	↔
Chair (large)	King's chair	0.86	DDA, O	21 (36)	↑
Chair (medium)	Chair	0.8	DU, DDA	39 (67)	↔
Chair (small)	Chair	1.14	DU	50 (86)	↑
Doloni chair	Rocking chair	0.92	DDA, O	28 (48)	↓
Mora (large)	Wicker stool	1	DDA, O	15 (26)	↔
Mora (medium)	Wicker stool	1.14	DU	31 (53)	↑, →
Mora (small)	Wicker stool	2	DU	53 (91)	↑, →
Dolna	Cradle	0.92	DDA	33 (57)	↑, →
Table	Table	1	DU	41 (71)	↔, →
Dressing table	Dressing table	1.33	DDA	26 (45)	↓
Tea table	Tea table	1.5	DDA	34 (59)	↑, →
Ayna frame	Mirror frame	1.6	DDA	45 (78)	↑, →
Kagoj box	Magazine box	2.67	DDA, O	28 (48)	↔, →
Jhuri	Basket	1.33	DU	47 (81)	↔, →
Phuldhani	Flower stand	1.33	DDA	42 (72)	↔
Chari/hat lathi	Walking stick	2	DU	49 (84)	↔
Tray	Tray	1.33	DDA, DU	39 (67)	↔, →
Sitalpati	Bed mat	2	DU, O	16 (28)	↑
Easy chair	Easy chair	1.33	DDA, O	25 (43)	↑
Book shelf	Book shelf	0.92	DU, DDA	55 (95)	↑, →
Wall shelf	Wall shelf	0.8	DDA	30 (52)	↑, →
Corner shelf	Corner shelf	1.33	DDA	26 (45)	↑
Side bati	Table lamp	2	DDA, O	37 (64)	↔
Partition/bera	False wall	1.67	DDA, O	14 (24)	↓, →
Bet	Rattan culms	4	O	29 (50)	↓
Brief case	Brief case	1.14	DDA	24 (41)	↔

^a DU domestic utensils, DDA domestic decorative article, O others^b Number and relative frequency of enterprises producing the item (n = 58)^c Trend of utilization (based on quantity sold): ↑, increased; ↓, decreased; ↔, unchanged and →, presence of substitute (bamboo based products)

were specific DU, nine were DDA and the rest were for occasional use. Bookshelves, stools and chairs were the most widely traded articles, and were available in various sizes. Bookshelves were the most common article (produced by 92% of enterprises) followed by small Mora and chairs (91 and 86%, respectively). In the study area, both production and selling is done at the same place by the small and medium enterprises

but larger enterprises have their own outlets in market places throughout the city. Almost all of the larger enterprises produce in response to orders from wholesalers, middlemen, retailers and shop owners. Larger enterprises also take production orders from various parts of the country and even from abroad.

Financial Analysis of Rattan-Based Products

Table 3 shows article produced, production cost, selling price and average profit for the surveyed enterprises. The production cost and selling price per article were highest for sofa sets in the three rattan origins, at up to Tk. 25,000 and 27,500, respectively. The lowest production cost per article were Tk. 100 for Kagoj (paper) boxes and Bet (rattan culms, used for punishment in school) followed by Tk. 120 for Chari/Hat lathi (walking sticks). The lowest selling price per article was Tk. 150 for Kagoj boxes and Bet, Tk. 120 for Chari/Hat lathi, Tk. 250 for Ayna (mirror) frame and Tk. 300 for small sized Mora (wicker stools). The highest average profit per article was Tk. 1,000, 1,500 and 2,500 for sofa set of all rattan origin and the lowest average profit per article was Tk. 50 for Kagoj box, Bet (local rattan), Tk. 130 for Chari/Hat lathi (Myanmar rattan) and Tk. 200 for table (Indonesia rattan).

The highest revenue from large sized wicker stool was Tk. 720,000 followed by Tk. 656,000 for tea or side tables and Tk. 470,000 for sofa sets of all-rattan construction. Considering the three rattan origins, it was observed that the processing cost (Tk.) per article of local and Myanmar rattan products was less and the sales volume was greater than for Indonesia rattan species because the higher cost per article using Indonesian rattan (Table 3).

Marketing Pattern of Rattan-Based Products

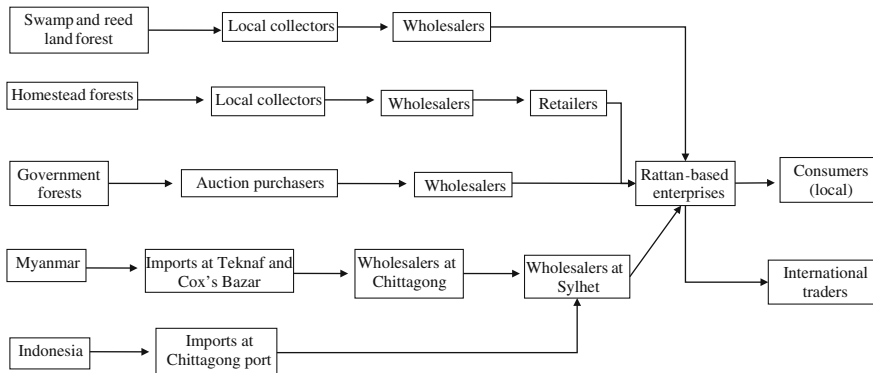
The respondents reported an organized marketing system for the finished products and unprocessed raw materials in the study area; entrepreneurs sold their products intermittently in local markets directly or through intermediaries, with uniform pricing. The products were transported by the producer themselves from the cottage site to the market, which are then transported to other cities of the country and then distributed to various rattan-based enterprises across these cities. Unprocessed raw materials are procured from local, regional and international sources. Local and regional sources include Chittagong, Chittagong Hill Tracts, Sylhet, Sunamgonj, Moulvibazar, Comilla, Boirav and Rajshahi districts. Government natural and plantation forests, homestead forests, swamp and low-lying areas of greater Sylhet region also supply a greater amount of rattan and these are the places where rattan grows best naturally. Entrepreneurs were not interested in obtaining rattan from government forests due to lengthy auction purchasing process. Swamp forests of Gowainghat, Jaintiapur, Companigonj, Jakigonj and Jaflong areas in greater Sylhet district are rich in naturally grown rattan. The international sources of rattan include Indonesia and Myanmar. Local rattan markets in the greater SCC exist at Ghassitula, Bondor Bazar, Uposohor, Zindabazr, Shekghat and Amberkhana. The major marketing channels for the raw materials (unprocessed and processed) from all sources and selling of the final products are illustrated in Fig. 3.

Table 3 Rattan products and origin with their production cost and selling price per article, average number of article sold annually and revenue

Article name	Rattan origin	Production cost (Tk/unit)	Selling price (Tk./unit)	Net avg. profit (Tk./unit)	Average number of article sold annually	Revenue (Tk.) annually (No. of article) \times (net avg. profit per article)
Khat (large)	Local	5,300	6,200	900	250	225,000
	Myanmar	8,500	10,000	1,500	80	120,000
	Indonesia	24,000	26,000	2,000	25	50,000
Khat (medium)	Local	2,800	3,400	600	400	240,000
	Myanmar	3,400	4,300	900	160	144,000
Sofa set (1 set)	Local	8,000	9,000	1,000	470	470,000
	Myanmar	13,500	15,000	1,500	220	330,000
	Indonesia	25,000	27,500	2,500	110	275,000
Chair (large)	Local	700	950	250	400	100,000
	Myanmar	900	1,350	450	170	76,500
	Indonesia	2,800	3,550	750	60	45,000
Chair (medium)	Local	600	750	150	580	87,000
	Myanmar	1,000	1,200	200	250	50,000
	Indonesia	2,400	2,800	400	120	48,000
Chair (small)	Local	450	600	150	1,100	165,000
	Myanmar	700	850	150	700	105,000
	Indonesia	1,800	2,100	300	300	90,000
Doloni chair	Local	2,250	2,600	350	1,000	350,000
	Myanmar	3,000	3,400	400	540	216,000
	Indonesia	5,200	5,700	500	220	110,000
Mora (large)	Local	3,200	3,800	600	1,200	720,000
Mora (Medium)	Local	400	500	100	1,500	150,000
Mora (Small)	Local	200	300	100	2,000	200,000
Dolna	Local	1,100	1,400	300	1,200	360,000
	Myanmar	2,500	2,900	400	750	300,000
Table	Local	600	750	150	1,500	225,000
	Myanmar	700	900	200	800	160,000
	Indonesia	1,550	1,800	250	470	117,500
Dressing table	Local	1,200	1,500	300	950	285,000
	Myanmar	1,500	2,000	500	370	185,000
	Indonesia	2,500	3,200	700	130	91,000
Tea/side table	Local	900	1,300	400	1,640	656,000
Ayna frame	Local	150	250	100	1,580	158,000
Kagoj box	Local	100	150	50	1,260	63,000
Jhuri	Local	350	450	100	2,650	265,000
Phuldhani	Local	300	400	100	1,750	175,000

Table 3 continued

Article name	Rattan origin	Production cost (Tk/unit)	Selling price (Tk./unit)	Net avg. profit (Tk./unit)	Average number of article sold annually	Revenue (Tk.) annually (No. of article) × (net avg. profit per article)
Chari/hat lathi	Local	120	200	80	2,460	196,800
	Myanmar	270	400	130	1,440	187,200
Tray	Local	300	400	100	1,470	147,000
Sitalpati	Myanmar	1,300	1,500	200	1,660	332,000
Easy chair	Local	2,100	2,500	400	1,170	468,000
Book shelf	Local	450	600	150	2,700	405,000
Wall shelf	Local	250	400	150	2,230	334,500
Corner shelf	Local	400	600	200	1,720	344,000
Side bati	Local	500	700	200	1,560	312,000
	Myanmar	650	900	250	430	107,500
Partition/bera	Local	750	1,000	250	980	245,000
	Myanmar	1,000	1,300	300	750	225,000
Bet	Local	100	150	50	2,550	127,500
Brief case	Local	450	600	150	880	132,000
	Myanmar	550	750	200	570	114,000
Sum		138,740	160,850	22,110	49,475	11,084,500
Average		2,392	2,773	381	853	191,112
STDEV		5,084	5,557	496	753	145,567

**Fig. 3** Marketing flowchart for raw materials and rattan-based products in the study area

Problems and Urgent Priorities Identified by Rattan Entrepreneurs

When questioned about prevailing problems and priorities in the local and national industry, most of the entrepreneurs observed that increased cost in raw materials,

Table 4 Major problems or issues in rattan-based product trading reported by entrepreneurs

Major problem or issue	Number of entrepreneurs and relative frequency (%)
Increased cost in raw materials, production and processing	49 (84)
Scarcity of raw materials	36 (62)
Unwillingness of future generations to enter this profession	27 (47)
Lack of institution to encourage or trained local artisans	31 (53)
Market insecurity (seasonal demand fluctuation)	39 (67)
Consumers attitudinal change (in preference)	29 (50)
Competition among the enterprises and with other substitute goods	36 (62)

production and processing (84%), market insecurity (67%) and both scarcity of raw materials and competition among the enterprises and with other substitute goods (62%) as the major problems for the trading of rattan-based products nowadays (Table 4). Entrepreneurs therefore suggested various measures, at the local and national level, to increase profitability, particularly to ensure a sustainable supply of high quality raw materials (100% entrepreneurs), market development (90%), active support from both electronic and print media for publicity (83%) and 78% of raise a national network for rattan-based product producers (Table 5).

Concluding Comments

The survey revealed that the rattan-based industry including raw material collection, processing and marketing makes a great contribution to economic upliftment in Bangladesh through providing employment opportunities for the poor, woman and skilled artisans. This industry generates continuously substantial revenue locally, after allowing for costs, and is an important source for foreign currency earnings. Globally, the demand of rattan-based products is high and increasing, and there is scope for government to promote expanded production. If the rattan-based industry is supported and marketing facilities are improved for selling products abroad to attract high prices, this has much potential to generate foreign exchange along with creation of employment opportunities for thousands of artisans. Government and NGOs with the help of the Forest Department can play a key role in, for example: organizing rattan-based enterprises and assisting them to obtain a higher share of marketed products; providing credit and financial loans to the entrepreneurs; promoting technical advancement of the processing units, and in storage; setting up small-scale rattan-based enterprises; and designing sustainable forest management plans for continuous supply of rattan from the forests. Moreover, entrepreneur's

Table 5 Entrepreneur's suggestions to improve the condition of rattan-based enterprises

Suggested measure	Number of entrepreneurs and relative frequency (%)
Development of market facilities	52 (90)
Provide training and other facilities to entrepreneurs and artisans	37 (64)
Active governments' support in export of rattan-based products	33 (57)
Ensure sustainable supply of high quality raw materials	58 (100)
Technological up gradation of processing units	40 (69)
Provide micro-finance and credit facilities	39 (67)
Raise a national network for rattan-based product producers	45 (78)
Establish a local and national buying house and information center for rattan-based products	39 (67)
Active support from both electronic and print media for publicity	48 (83)
Undertaken more research activities for technological up gradation	38 (66)

believed that this study would attract the attention of policy-makers and financial institutions that could provide financial support to them and create a more favourable business environment for the enterprises.

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References

- Alam MK (1990) Rattans of Bangladesh. Bulletin 7. Plant taxonomy series. Bangladesh Forest Research Institute, Solo Sohor, Chittagong
- Alam M, Furukawa Y (2009) Rattan (Rattan) enterprises as family business in Bangladesh: a case study. *Elec J Fam Bus Stud* 3(2):135–144
- Alam MK, Khan SU (2006) Rattan. *Banglapedia: national encyclopedia of Bangladesh*. Available online at: http://www.banglapedia.org/httpdocs/HT/C_0034.HTM. Last accessed 21 December 2011
- Alamgir M, Jashimuddin M, Bhuiyan MAR (2005) Employment generation and economics of rattan based furniture enterprises of Chittagong, Bangladesh. *J Bamboo Rattan* 4(3):279–292
- Alamgir M, Bhuiyan MAR, Jashimuddin M, Alam MS (2006) Economic profitability of rattan based furniture enterprises of Chittagong city corporation area, Bangladesh. *J For Res* 17(2):153–156
- Ara R (1997a) Silviculture, improvement and conservation of rattan in Bangladesh. In: Rao AN, Rao VR (eds) *Rayyan taxonomy, ecology, silviculture, conservation, genetic improvement and biotechnology*. IPGRI-APO, Serdang, Malaysia, pp 47–53

- Ara R (1997b) Taxonomy and ecology of rattan in Bangladesh. In: Rao AN, Rao VR (eds) Rayyan taxonomy, ecology, silviculture, conservation, genetic improvement and biotechnology. IPGRI-APO, Serdang, Malaysia, pp 76–79
- Arnold JEM (1995) Socio-economic benefits and issues in non-wood forest products use. In: Report of the international expert consultation on non-wood forest products. Non-wood forest products 3, FAO, Rome, Italy, pp 89–123
- Azad MS (2002) Status and marketing of rattan products in Khulna city corporation. Master's thesis, forestry and wood technology discipline. Khulna University, Khulna, Bangladesh
- Banglapedia (2011) Sylhet district. National encyclopedia of Bangladesh, asiatic society of Bangladesh, Dhaka. Available online at: http://www.banglapedia.org/httpdocs/HT/S_0650.HTM. Last accessed 16 May 2011
- Banik RL (1998) Conservation and propagations challenges of bamboo and rattan resources in Chittagong hill tracts. In: Banik RL, Alam MK, Pei SJ, Rastogi A (eds) Applied ethnobotany. BFRI-UNESCO-ICIMOD, Chittagong, Bangladesh, pp 103–111
- Basit MA (1995) Non-wood forest products from the mangrove forests of Bangladesh. In: Durst PB and Bishop A (eds) Beyond timber: social, economic and cultural dimensions of non-wood forest products in Asia and the Pacific. Proceedings of a regional expert consultation held in Bangkok, 28 November to 2 December 1994. FAO Regional Office for Asia and the Pacific (FAO-RAP), Bangkok, pp 193–200
- Bawa KS, Gadgil M (1997) Ecosystem services, subsistence economies and conservation of biodiversity. In: Daily G (ed) Nature's services: societal dependence on natural systems. Island Press, Washington (DC), pp 295–310
- BBS (2002) Statistical year book of Bangladesh. Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka
- BBS (2006) Statistical year book of Bangladesh (Thana series). Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka
- BBS (2009) Statistical pocket book of Bangladesh-2008. Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka
- Corner EJH (1966) The natural history of palms. Wiedenfield and Nicolson, London, UK
- Dransfield J (1992) Traditional uses of rattan. In: Wan RWM, Dransfield J, Manokaran N (eds) A guide to the cultivation of rattan. Forest research institute: forest record no. 35, FRI, Kuala Lumpur, Malaysia, pp 59–64
- Durst PB, Ulrich W, Kashio M (eds) (1994) Non-wood forest products in Asia. RAPA Publication 1994/28, FAO-RAPA Bangkok, Thailand
- FAO (1993) Small scale forest based processing enterprises. FAO forestry paper no. 79. Food and Agriculture Organization of the United Nations, Rome, Italy, p 63
- Farhana T (2009) Rattan: the aristocratic décor. Available online at: http://www.thefinancialexpress-bd.com/more.php?news_id=87413&date=2009-12-22. Last accessed 16 May 2011
- GOB (1993) Forestry master plan: participatory forestry. Government of Bangladesh, UNDP/FAO/BGD 88/025 (TA No. 1355-BAN). Asian development bank: Dhaka, Bangladesh
- Gunatilake HM, Senaratne DMAH, Abeygunawardena P (1993) Role of non-timber forest products in the economy of peripheral communities of knuckles national wilderness area of Sri Lanka. Econ Bot 47(3):275–281
- Hegde R, Suryaprakash S, Achoth L, Bawa KS (1996) Extraction of non-timber forest products in the forest of Biligiri Rangan hills, India. 1. Contribution to rural income. Econ Bot 50:243–251
- INBAR (2011) International network for bamboo and rattan. Available online at: <http://www.inbar.int/index.ASP>. Last accessed 20 April 2011
- KPSHK (2010) Rattans in Bogor Botanical Garden. Konsorsium Pendukung Sitem Hutan Kerakyatan. Bogor, Indonesia. Available online at: <http://en.kpskh.org/index.php/artikel/read/2010/08/21/1004/rattans-in-bogor-botanical-garden.kpskh>. Last accessed 18 Aug 2011
- Mohiuddin M and Ara R (1995) Effect of different sowing media on the seed germination of *Calamus tenuis* Roxb. (Jail bet). Chittag Univ Stud Sci 19(2):303–305
- Mohiuddin M, Rashid MH, Rahman MR (1986) Seed germination and optimal time of transfer of seedlings of *Calamus* spp. from seed bed to polythene bag. Ban o Biggyan Patrika 15(1&2): 21–24
- Nath TK, Uddin MB, Ahmed R (2000) Role of bamboo based cottage industry in economic upliftment of rural poor: a case study from rural Bangladesh. Malays For 63(3):98–105

- TSPN [Trade Standards Practitioners Network] (2011) Non-timber forest products: preserving forests, maintaining livelihoods. Available online at: <http://tradestandards.org/en/Topic.18.aspx>. Last accessed 18 Aug 2011
- Nuruzzaman M (2001) National report on the state of bamboo and rattan development in Bangladesh. Forest Department, Ban Bhavan, Dhaka, Bangladesh
- Rahman SMM (2006) Cottage Industry. Banglapedia: national encyclopedia of Bangladesh. Available online at: http://www.banglapedia.org/httpdocs/HT/C_0356.HTM. Last accessed 21 Dec 2011
- Rahman, MH (2010) Urbanization and hill cutting: study on environmental change in Sylhet, B.Sc. dissertation, department of forestry and environmental science, Shahjalal University of Science and Technology, Sylhet, Bangladesh, p 113
- Rana MP, Mukul SA, Sohel MSI, Chowdhury MSH, Akhter S, Chowdhury MQ, Koike M (2010) Economics and employment generation of bamboo-based enterprises: a case study from eastern Bangladesh. *Small scale For* 9:41–51
- Sunderland TCH (1998) The Rattans of Rio Muni, Equatorial Guinea: Utilisation, Biology and Distribution. Report to the Proyecto Conservación y Utilización Regional de los Ecosistemas Forestales (CUREF)—Fondo Europeo de Desarrollo—Proyecto No. 6-ACP-EG 020. CUREF
- Uddin MB, Mukul SA (2007) Improving forest dependent livelihoods through NTFPs and home gardens: a case study from Satchari National Park. In: Fox J, Bushley B, Dutt S, Quazi SA (eds) Making conservation work: linking rural livelihoods and protected areas in Bangladesh. East-West Center, Hawaii and Nishorgo Support Project of Bangladesh Forest Department, Dhaka, pp 13–35
- Uddin MS, Mukul SA, Khan MASA, Alamgir M, Harun MY, Alam MS (2008) Small-scale Agar (*Aquilaria agallocha* Roxb.) based cottage enterprises in Maulvibazar District of Bangladesh: production, marketing and potential contribution to rural development. *Small scale For* 7(2):139–149
- Uma Shankar R, Murali KS, Uma Shaanker R, Ganeshaiah KN, Bawa KS (1996) Extraction of non-timber forest products in the forests of Biligiri Rangan hills, India. 3. Productivity, extraction and prospects of sustainable harvest of amla, *Phyllanthus emblica* (Euphorbiaceae). *Econ Bot* 50:270–279
- Uma Shankar R, Lama SD, Bawa KS (2001) Ecology and economics of domestication of non-timber forest products: an illustration of broom grass in Darjeeling Himalaya. *J Trop For Sci* 13(1):171–191
- Wikipedia (2001) Rattan. Available online at: <http://en.wikipedia.org/wiki/Rattan>. Last accessed: 17 May 2011
- Zasimuddin MD (2004) Community forestry for poverty reduction in Bangladesh: can community forestry make money. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand, pp 81–94